REMARKS

Claims 1-10, 12-15 and 20 are pending. Claim 11 was previously cancelled. Claims 16-19 were previously withdrawn from consideration. Reconsideration of the application is requested.

§ 103 Rejections

In order to establish a legally sufficient *prima facie* case of obviousness, the Patent Office must, among other requirements, (A) determine the scope and contents of the prior art and (B) ascertain the differences between the prior art and the claims at issue. When performing these steps, the claimed invention must be considered as a whole. In addition, the references must be considered as a whole. (See, e.g., MPEP § 2141(I).)

Although the Patent Office has identified certain elements of the claimed invention in unrelated portions of a single reference or in different references, for at least the reasons discussed below, Applicants believe the present claims, when considered as a whole, are patentable when the prior art is considered as a whole.

Claims 1-10, 12-15, and 20 are rejected under 35 USC § 103(a) as being unpatentable over Ellis (US 5,637,646) in view of Moon et al. (US 6,174,931) and Levens (US 4,303,485).

Independent claim 1 provides a method of preparing a pressure-sensitive adhesive. The method includes five steps and four distinct compositions. As summarized in Table 1, each of the four compositions has specific characteristics as set forth in claim 1.

Step (i) of the method requires providing the first of the four compositions; i.e., the "essentially solvent free mixture." In step (ii), this essentially solvent free mixture is partially polymerized to form the second composition, i.e., the "partially polymerized mixture." The third composition, i.e., the "radiation curable precursor," is provided in step (iii) by adding one or more free-radical radiation polymerization initiators to this partially polymerized mixture. In step (iv), this radiation curable precursor is applied to a substrate. Finally, in step (v), the fourth composition, i.e., the "pressure-sensitive adhesive" is provided by further polymerizing the radiation-curable precursor by subjecting it to actinic irradiation in a non-inert atmosphere.

Table 1: Properties of the four compositions referred to in claim 1.

Composition	Description
essentially solvent-free mixture	• Comprises free radically polymerizable monomers and at least one free-radical polymerization initiator • Comprises less than about 20 weight percent solvent
partially polymerized mixture	• Result of the partial polymerization of the **essentially solvent-free mixture** • Brookfield viscosity of between 1,000 and 125,000 mPa·s at 20 °C • Degree of conversion of monomers to polymer of between 30-60 wt.% with respect to the initial mass of the monomers
radiation-curable precursor	• Provided by adding one or more free-radical radiation polymerization initiators to the **partially polymerized mixture** • Applied to a substrate in step (iv)
pressure-sensitive adhesive	• Results from the further polymerizing the **radiation-curable precursor** by subjecting it to actinic irradiation in a non-inert atmosphere.

In the pending Office Action, the Patent Office offers the following summary of Ellis.

> Ellis discloses a method for preparing pressure sensitive adhesives which comprises the steps of: (i) providing a an essentially solvent-free mixture comprising one or more free radically polymerizable monomer having one ethylenically unsaturated group and at least one free radical polymerization initiator where the mixture comprises less than 20 weight percent of solvent (see col. 7, line 55 – col. 10, line 47; col. 11, line 54 – col. 12, line 7; and col. 12, lines 28-44); partially polymerizing the mixture where the partially polymerized mixture has a conversion of about 39% as shown in Example 1 (see col. 23,lines 29-31). Ellis teaches that the viscosity should be less than 200,000 centiposes.

Applicants believe the Patent Office is relying on this analysis in an attempt to show that the Ellis describes the step (i) and step (ii) of claim 1. Applicants respectfully submit that this approach is flawed as it fails to consider the claimed invention as a whole.

Claim 1 requires that the partially polymerized mixture provided by step (ii) have both a Brookfield viscosity of between 1,000 and 125,000 mPa·s at 20 °C and a degree of conversion of

monomers to polymer of between 30 – 60 wt. % with respect to the initial mass of the monomers prior to polymerization. The cited passage of Ellis (col. 23, lines 29-31) describes a sample of a reaction mixture containing 61 weight % of unreacted IOA based on the total weight of the mixture. Applicants note that the Patent Office has incorrectly determined that this corresponds to a conversion of 39%. In order to determine the correct degree of conversion, one must calculate the weight of the partially polymerized material divided by the initial weight of the monomers.

Even assuming the result indicates a degree of conversion between 30-60 wt.%, the Patent Office has failed to show how Ellis describes, teaches or suggests a Brookfield viscosity of between 1,000 and 125,000 mPa·s at 20 °C for such a composition. According to the Patent Office, Ellis teaches that the viscosity should be less than 200,000 centipoise; however, Ellis describes a variety of different viscosities, and the Patent Office has failed to show how any value corresponds to the viscosity of the partially polymerized mixture of step (ii) at a temperature of 20 °C. For example, at col. 4, lines 17-21, Ellis teaches a Brookfield viscosity of less than 500,000 centipoise at **draining temperature**. Referring to Example 1, Ellis describes a draining temperature of 180 °C and a viscosity of 60,000 centipoise. At col. 16, lines 28-34, Ellis teaches a Brookfield viscosity of less than about 200,000 centipoise **at mixing temperature**. Referring to Example 1, Ellis describes a mixing temperature of about 52 to 66 °C (see col. 23, lines 33-55). (See also, Example 2 (col. 25, lines 40) and Example 3 (col. 26, lines 46-60.) Thus, Applicants respectfully submit that the Patent Office has not provided a sufficient basis for attributing any particular viscosity, measured at 20 °C, to the reaction sample described at col. 23, lines 29-31.

The Patent Office also relies on Moon for its teaching of a suitable viscosity for coating, noting that Moon states that "an acceptable viscosity for coating is 2500-4000 centipoise." However, the Patent Office has failed to show how any of the cited references describe, teach or suggest a partially polymerized mixture having both a degree of conversion of monomers to polymer of between 30 – 60 wt. % and a viscosity of 2500-4000 centipoise required by Moon. Applicants respectfully submit that the mere fact that a reference teaches the desirability of a particular viscosity range for a specific purpose (e.g., Moon) is not a legally sufficient basis for arguing that all solutions having such a viscosity are obvious or obtainable by routine

experimentation regardless of any other required properties such as a degree of conversion of between 30-60 wt.%.

In addition, Applicants respectfully submit that the Patent Office's reliance on Moon to address the deficiencies in Ellis is improper. The Patent Office has failed to show why one of ordinary skill in the art would desire a coatable viscosity for the sample of Ellis cited by the Examiner in support of a 39% degree of conversion. Applicants note, e.g., that Ellis fails to describe, teach or suggest coating this material, rather, Ellis only teaches further polymerizing it to a material having a viscosity of 60,000 centipoise at 180 °C and coating this material only after dissolving it in ethyl acetate 50% by weight. (See, col. 23, line 29 – col. 24, line 54; and col. 19, lines 23-36.)

In order to address steps (iii), (iv) and (v) of claim 1, the Patent Office improperly combines unrelated teachings in Ellis, Moon, and Levens, improperly guided by the hindsight obtained from Applicants' claims. Considering claim 1 as a whole, the Patent Office must establish the obviousness of (iii) adding one or more free-radical radiation polymerization initiators to a partially polymerized mixture exhibiting a Brookfield viscosity of between 1,000 and 125,000 mPa•s at 20 °C and a degree of conversion of monomers to polymer of between 30 – 60 wt. % to provide a radiation-curable precursor; (iv) applying this radiation-curable precursor to a substrate; and (v) further polymerizing the radiation-curable precursor by subjecting it to actinic irradiation in a non-inert atmosphere.

The Patent Office acknowledges that Ellis fail to describe the addition of a free-radical radiation polymerization initiator to a partially polymerized mixture. According to the Patent Office, Moon teaches the addition of a free-radical radiation polymerization initiator. However, the Patent Office has failed to show how Ellis or Moon describe the addition of such an initiator to a partially polymerized mixture exhibiting a Brookfield viscosity of between 1,000 and 125,000 mPa•s at 20 °C and a degree of conversion of monomers to polymer of between 30 – 60 wt. % to provide a radiation-curable precursor; and applying this radiation-curable precursor to a substrate.

In addition, the Patent Office acknowledges that Moon teaches that its process is preferably performed in an inert atmosphere, but argues that this statement does not exclude the

use of a non-inert atmosphere. Applicants respectfully submit that such an observation is not a sufficient basis for establishing that Moon provides any basis for concluding that Moon renders obvious the performance step (v) of the present invention in an inert environment.

The Patent Office further asserts that Levens teaches that the polymerization can be performed in an inert environment. However, Levens specifically requires the addition of a tin salt in order to allow polymerization in a non-inert environment, and then only if the coating thickness is greater than 1.5 mm. (See col. 2, lines 26-28.) However, as expressly taught by Levens, an inert atmosphere is still required for thinner layers even when the tin salt is present. (See, e.g., col. 3, lines 19-32.)

Applicants respectfully submit that, at best, Levens offers one solution to the problem of having to polymerize in an inert environment; however, this solution requires the addition of tin salt and even then only offers a non-inert approach when polymerizing thick layers. The present invention provides a patentably distinct approach. As the Applicants expressly noted in the detailed description:

> It was surprisingly found that the precursors of the present invention can be cured in a non-inert, for example oxygen-containing atmosphere such as ambient atmosphere, without adversely affecting the properties of the resulting pressure-sensitive adhesive material to a degree relevant for any practical purposes. This is of considerably practical and economical importance since the application of the precursor is facilitated and not hampered by the need of maintaining an inert protection gas atmosphere.

(Page 22, line 28 – page 23, line 2).

Thus, step (v) of the present invention is in direct contrast to Moon's teaching that "irradiation for both stages is preferably carried out in the absence of oxygen," (col. 5, lines 5-6; see also Examples), and Ellis's suggested use of an inert atmosphere. (See, e.g., col. 16, lines 50-58). Applicants note that such an unexpected discovery further supports the non-obviousness of the method of claim 1. (See MPEP § 2141(III) (Objective evidence such as unexpected results must be considered in every case in which they are present.).)

In summary, when considering claim 1 as a whole, including each of the recited process steps and the required properties of each of the four identified compositions, the Patent Office has failed to show the cited references (considered as a whole) render the present invention

obvious. In fact, notwithstanding the Patent Office's identification of isolated elements of the claimed invention, when considering these references as a whole, it is clear that the present Applicants have provided a new and unobvious method of providing pressure sensitive adhesives. For at least these reasons, the rejection of claim 1 under 35 USC § 103(a) as being unpatentable over Ellis '646 in view of Moon et al.'931 and Levens '485 is unwarranted and should be withdrawn.

Claims 2-10, 12-15, and 20 each depend from claim 1 and add patentable features thereto. Claim 1 is patentable for at least the reasons stated above; thus, claims 2-10, 12-15, and 20 are likewise patentable. In addition:

(a) with respect to claim 3, Applicants reiterate that the Patent Office has failed to show how Ellis describes the required combination of viscosity at 20 ºC and 30-60 wt.% monomer conversion;

(b) with respect to claims 5-8; the Patent Office has failed to show how Ellis or Moon teach the addition of a photoinitiator to the prepolymerized mixture of the present claims; thus, it is improper to rely on the disclosed amounts and types of initiators set forth in Ellis and Moon as they are added to different compositions; and

(c) with respect to claims 9-10, Ellis teaches a wide range of polydispersities (e.g., 18 for Example 1; 30 for Example 2, 16 for Example 4, and 3.6 for Example 4.) Although the polydispersities reported for Examples 9-11 range from 2.18 to 2.26, the Patent Office has failed to show how this range of polydispersities bears any relationship to a partially polymerized mixture exhibiting a Brookfield viscosity of between 1,000 and 125,000 mPa·s at 20 °C and a degree of conversion of monomers to polymer of between 30 – 60 wt. % with respect to the initial mass of the monomers prior to polymerization as required by claim 9; or to such a composition further comprising one or more free-radical radiation polymerization initiators (i.e., the radiation-curable precursor) as required by claim 10.

In view of the above, it is submitted that the application is in condition for allowance. Examination and reconsideration of the application is requested.

If any issues remain, Applicant requests a telephone interview to more fully understand the examiners position and advance this case to issuance.

Respectfully submitted,

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By: /Thomas M. Spielbauer/
Thomas M. Spielbauer, Reg. No.: 58,492
Telephone No.: 651-736-9814

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833